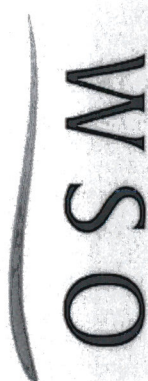


Level 1 Validation Certificate

Audit Year: **CY 2019**



This document verifies that the Level 1 Validation process was completed. The session details and audit review outcomes are included here.

This certificate is required for submission – alongside the Level 1 validated water audit software file – to the California Department of Water Resources.

Call Date: 9/24/2020

Water Supplier

Supplier Name: Fair Oaks Water District

Supplier Participants: Robert Barragan

Key Audit Metrics

Data Validity Score: 74

ILI: 1.5

Real Loss: 26.24 gal / conn / day

Apparent Loss: 8.44 gal / conn / day

Non-Revenue Water as Percent of Cost of Operating System: 1.5%

Validator

Validator: Colin Stief
Water Systems Optimization

Validator Qualifications: Water Audit Validator Certificate from the AWWA California Nevada Section

Certification Statement by Validator

This water loss audit report has been Level 1 validated per the requirements of California Code of Regulations Title 23, Division 2, Chapter 7 and the California Water Code Section 10608.34.

All recommendations on volume derivation and Data Validity Grades were incorporated into the water audit. ☒

Level 1 Validation – Water Supplier Confirmation

This document confirms participation in and endorsement of the Level 1 Validation as completed.

This acknowledgement is required for submission – alongside your Level 1 validated water audit software file – to the California Department of Water Resources.

Water Supplier Name:

Fair Oaks Water District

Water Supplier Public Water System ID:

3410009

Water Audit Period:

Calendar Year 2019

Water Audit & Water Loss Improvement Steps

Steps taken in the audit period timeframe to increase data source accuracy, reduce real losses, and/or reduce apparent losses, as informed by the water audit.

Fair Oaks Water District increased our data source accuracy by obtaining San Juan Water District export meter testing results. We replaced approximately 1400 feet of aging water main. FOWD continued to track estimated water losses based on the severity of leaks and track the estimated losses of water when flushing hydrants. We also continued replacing meters per our normal meter exchange program based on age and functionality. The Customer Meter Testing Program continued which tested a sample of random meters whose stratification (by size, age, or other characteristics) represents customer meter stock. Phase II of the SCADA project was completed and allowed a more efficient, consistent and reliable day to day operations monitoring pressure reductions.

Certification Statement by Water Supplier Executive:

This water loss audit report meets the requirements of California Code of Regulations Title 23, Division 2, Chapter 7 and the California Water Code Section 10608.34 and has been prepared in accordance with the method adopted by the American Water Works Association, as contained in their manual, *Water Audits and Loss Control Programs, Manual M36, Fourth Edition* and in the Free Water Audit Software version 5.

Executive Name (print):

Tom R. Gray

Executive Position:

General Manager

Signature:



Date

9-29-2020

Level 1 Validation Summary Notes

This document includes detailed notes about utility practices as reviewed during third-party level-one water audit validation.

This document is not a required submission to the California Department of Water Resources. It is meant to provide background and documentation of the validation process.

Call Information

Utility

Utility Name: Fair Oaks Water District

Utility Participants: Robert Barragan

Call Date: 9/24/2020

Validator

Validator: Colin Stief, Water Systems Optimization

Validator Qualifications: Water Audit Validator Certificate from the AWWA
California Nevada Section

Validation Call Notes

Audit Input

Grade Audit Input Notes

Volume from Own Sources

5

Source Meter Profile: Groundwater from 4 wells. Turbine meters.

Derivation: SCADA reads from production meters as archived.
Comments: Input derivation from supporting documents confirmed. Exclusion of non-potable volumes confirmed.

Data Validity Grade Notes

Approximate Percent of Volume Metered: 100%
Approximate Percent Tested and/or Calibrated: n/a.
Calibration Frequency: Within last 5 years but less than annually.
Volumetric Testing Frequency: Annual.
Volumetric Testing Method: n/a.
Comments: DVG of 5 because 100% metered and annual testing, but no documentation.

Volume from Own Sources
Master Meter and Supply
Error Adjustment

3

Derivation: Left blank in absence of available test data.
Change in Storage Considered: No.
Comments: No additional comments.

Water Imported

9

Import Meter Profile: 2 connections with SJWD, a 30" and 40" meter. Only 1 meter active in CY2019.
Derivation: Totalization of volumes per invoices received from exporter.
Comments: Input derivation from supporting documents confirmed. Exclusion of non-potable volumes confirmed. Not sure if calibration or testing is performed.

Source Meter Read Method: Automatic logging via SCADA telemetry.
Source Meter Read Frequency: Continuous.
Data Review Practices: Each business day.
Real-Time Storage Level Monitoring: Yes.
Comments: DVG of 3 because of access to continuous reads via SCADA and monthly data review.
Approximate Percent of Volume Metered: 100%
Approximate Percent Tested and/or Calibrated: 100%
Calibration Frequency: Annual.
Volumetric Testing Frequency: Annual.
Volumetric Testing Method: Pitot tube
Comments: DVG of 9 because 100% metered and annual accuracy testing and electronic calibration with documentation provided

Water Imported Master Meter and Supply Error Adjustment	5	Derivation: Left blank in absence of available test data. Comments: No additional comments.	Import Meter Read Method: Automatic logging via SCADA telemetry. Import Meter Read Frequency: Continuous. Data Review Practices: Monthly. Comments: DVG of 5 because of access to continuous reads via SCADA and monthly data review.
Water Exported	n/a	Export Meter Profile: n/a Comments: Input derivation from supporting documents confirmed. Exclusion of non-potable volumes confirmed. Exclusion from BMAC input confirmed.	Approximate Percent of Volume Metered: 100% Approximate Percent Tested and/or Calibrated: n/a Calibration Frequency: n/a Volumetric Testing Frequency: n/a Volumetric Testing Method: n/a Comments: n/a
Water Exported Master Meter and Supply Error Adjustment	n/a	Derivation: n/a Comments: n/a	Export Meter Read Method: n/a Export Meter Read Frequency: n/a Data Review Practices: n/a Comments: n/a
Billed Metered Authorized Consumption	7	Derivation: From billing system Customer Meter Profile: Read Frequency: Bi-monthly. Reading Technology: AMR drive-by Age Profile: Small meters are fairly distribution, average about 10. Large meters are all between 1-3 years old. Comments: Lag-time correction is employed in input derivation. FOWD has 10+ AMR drive-by routes that are scattered over 2 months (bi-monthly billing) and to apportion the consumption for monthly summaries, they apply the percent of total production for that month. "For example, we know the annual amount of water used for irrigation because we have reads at beginning and end of the year – the total allocated for irrigation use that month would be 5% of the total irrigation water used for the year. At the end of the year all months will add up to 100% and will equal the actual annual total (not estimated)." This is done for each service type. Unclear how the percentage of total volume is assigned each month.	Approximate Percent Metered: 100% Small Meter Testing Practices: 50 random meters every year randomly tested. Number of Small Meters Tested: 50/ ~14,000 Large Meter Testing Practices: All 3" and larger are tested every 5 years Number of Large Meters Tested: 0/50 but usually are tested, just recently replaced General Replacement Practices: 2" and smaller they are replaced after 20 years. 3" and larger have all been replaced in the last 3 years. Billing Data Review: Standard billing QC, plus review of volumes by use type each billing cycle. Comments: DVG 7 because of proactive testing program (targeting small meters in 2019) and regular replacement of old meters.
Input derivation from supporting documents confirmed. Exclusion of non-potable volumes confirmed. "Unaccounted" and "Operation and Maintenance" water should be subtracted from BMAC.			

Billed Unmetered Authorized Consumption	n/a	Profile: n/a Derivation: n/a Comments: n/a	Policy for Metering Exemptions: n/a Comments: n/a
Unbilled Metered Authorized Consumption	n/a	Profile: n/a Derivation: n/a	Policy for Billing Exemptions: n/a
Unbilled Unmetered Authorized Consumption	5	Profile: Operational flushing and fire department usage. Comments: Have estimates for flushing, but there are other uses that could be estimated.	Comments: DVG 5 because CA default of 0.25% used.
Unauthorized Consumption	5	Comments: If there are indicators that there are tampering, they field check for theft.	Comments: DVG 5 because default used.
Customer Metering Inaccuracies	5	Derivation: Inferred from reference data (manufacturer, anecdotal test results) but not derived from test data analysis & calculation. Comments: Test results may not represent all small meter accuracy, so a more conservative 1% was chosen. *See BMAAC comments regarding meter testing & replacement activities.	Customer Meter Testing: Routine (proactive), but not fully representative. Customer Meter Replacement: Routine (proactive), but limited. Comments: DVG 5 because of proactive testing program (targeting small meters in 2019), regular replacement of old meters, but inferred input. Can increase by calculating input from test results, especially using a random and representative sample.
Systematic Data Handling Errors	5	Comments: Default input applied.	Comments: DVG 5 because default used.
Length of Mains	9	Derivation: Totaled from GIS based map. Hydrant Laterals Included: Uncertain. Comments: Engineering department provides value, uncertain how the number is derived.	Map Format: Digital. Asset Management Systems: In place but separate from GIS system. Map Update Process: Accomplished through normal work order processes. Comments: DVG of 9 because of existence of accurate computerized map and asset management system.
Number of Service Connections	10	Derivation: Standard report run from billing system. Basis for Query: Meter ID - non-premise based. Comments: Billing system agrees with engineering system, which justifies a DVG 10. Also just went through a specific field verification on unknown service connections in the field map.	Field Validation: Accomplished via specific efforts for service inventory, outside of normal meter reading processes. Estimate of Error: 1%. Comments: DVG of 10 because of computerized records, estimate of error <1%, specifically targeted field verification, and agreement among all systems.

Average Operating Pressure	5	How Pressure is Maintained: 5 pressure zones maintained by closed valves. Pressure Range: 45 - 100 Derivation: Calculated as simple average from analysis of field data. Comments: Hydrant flushing not used for derivation	Pressure Data Collection: Hydrant pressures taken during routine system flushing and/or hydrant testing. Real-Time Monitoring: Basic - telemetry or pressure logging at boundary points (supply locations, tanks, PRVs, boosters). Hydraulic Model: One exists but has not been calibrated within the last 5 years. Comments: DVG of 5 because of calculated input and basic telemetry data. Can increase with access to "well-covered" telemetry data that exists within the distribution system (e.g. hydrants, mains) and not just at the boundary points (e.g. tanks, PRVs).
Annual Operating Cost	10	Derivation: From official financial reports. Comments: Confirmed costs limited to water only, and water debt service included.	Auditing Practices: Annually by a third party CPA. Comments: DVG of 10 because all costs incorporated into calculation and an annual 3 rd party audit.
Customer Retail Unit Cost	10	Rate Structure: Single rate for consumption fee. (Bulk of customer cost is a fixed fee which depends on meter size.) Derivation: Simple rate structure with only a single volumetric rate. Sewer charges are not based on water meter readings. Sewer revenues are not applicable. Comments: No additional comments.	M36 Review: Input calculations have not been reviewed by an M36 water loss expert. However, single rate structure suggests review not necessary. Comments: DVG of 10 because of single rate structure (for consumption-based fees).
Variable Production Cost	5	Primary Costs: Own sources and import supply. Secondary Costs: No secondary costs. Comments: No additional comments.	M36 Review: Primary costs. Input calculations have not been reviewed by an M36 water loss expert. Comments: DVG of 5 because primary costs used in calculation.

Infrastructure & Water Loss Management Practices:

Infrastructure age profile: All mains are 43 years old.

Infrastructure replacement policy (current, historic): The District replaces approximately 2,000 to 2,500 LF of water mains thru the annual capital budget.

Estimated main failures/year: The average number of main leaks in the last 6 years is 14.7 Estimated service failures/year: The average number of service leaks in the last 6 years is 41.0.

Extent of proactive leakage management: The District is actively replacing water mains constructed with steel pipe. The total length of remaining steel pipe is 10.82 miles (5.62 % of total). The District is actively replacing water services constructed with polyethylene pipe using copper pipe.

Other water loss management comments: No additional comments